UNITED STATES TESTING COMPANY, INC.

I. BACKGROUND AND PURPOSE

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During January of 1982, the Arnold & Porter law firm contacted the United States Testing Company, Inc. for purposes of conducting a research program to measure the in vivo air dilution of ventilated cigaretttes.

The brands selected for testing were:

- Each Respondent's Own Brand
- Barclay
- Carlton
- Merit
- Extended Filter

The brands of cigarettes selected for testing included a medium and a high dilution cigarette. Included were each respondent's own brand of cigarette. The basis for inclusion of own brand of cigarette related to a percent share of market of most leading brands of cigarettes. A final inclusion was an Extended Filter cigarette, which was similar to the Barclay cigarette in construction, however, the filter was longer than the longest Barclay cigarette available on the market.

The respondent panel was comprised of five-hundred (500) regular filtered cigarette smokers. All respondents participated in an unlit test. One-hundred thirty-four (134) of the five hundred (500) respondents participated in a lit test.

A separate cell of forty-seven (47) regular Barclay smokers was included in the test.

II. SUMMARY OF RESULTS

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The results of this research program are summarized as follows:

TABLE I

TOTAL % DILUTION

	UNLIT		LIT	
	Average % Dilution Tipped	Average % Dilution Untipped	Average % Dilution Tipped	Average % Dilution Untipped
Respondent's Own Brand	24.5	24.5	37.7	37.0
Barclay	73.1	45.6	79.9	55.6
Carlton	69.1	69.5	76.3	75.7
Merit	32.4	33.2	42.7	42.9
Extended Filter	72.2	32.2	80.0	42.0

% DILUTION

BARCLAY PANEL

	UNLIT		LIT	
	Average % Dilution Tipped	Average % Dilution Untipped	Average % Dilution Tipped	Average % Dilution Untipped
Own Brand Barclay	73.4	43.1	79.8	54.6
Barclay (Test)	76.8	49.9	82.8	60.2
Carlton	71.1	70.2	80.7	79.4
Merit	31.4	31.3	41.7	41.0
Extended Filter	71.9	33.4	80.5	45.4

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TABLE II

% DILUTION BY BRAND TYPE

UNLIT

	Base Number of Respondents	Average % Dilution Tipped	Average % Dilution Untipped
Own Brand (Total)	(500)	(24.5)	(24.5)
King	241	24.0	23.4
100	122	27.6	28.1
King Menthol	106	19.5	19.7
100 Menthol	31	33.1	34.4
Test Barclay (Total)	(500)	(73.1)	(45.6)
King	241	76.8	47.5
100	122	68.0	42.9
King Menthol	106	73.0	46.3
100 Menthol	31	64.4	38.9
Carlton (Total)	(500)	(69.1)	(69.5)
King	241	72.8	72.6
100	122	58.5	60.0
King Menthol	106	75.3	75.5
100 Menthol	31	60.8	62.1
Merit (Total)	(500)	(32.4)	(33.2)
King	241	32.9	33.6
100	122	30.8	31.4
King Menthol	106	33.2	33.9
100 Menthol	31	32.8	34.8
Extended Filter (Total)	(500)	(72.2)	(32.2)
King	241	71.7	32.0
100	122	73.3	31.5
King Menthol	106	72.7	34.6
100 Menthol	31	70.4	27.4

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TABLE II (CONT'D.)

% DILUTION BY BRAND TYPE

LIT

	Base Number of Respondents	Average % Dilution Tipped	Average % Dilution Untipped
Own Brand (Total)	(134)	(24.5)	(24.5)
King	70	24.0	23.4
100	43	27.6	28.1
King Menthol	15	19.5	19.7
100 Menthol	6	48.1	49.6
Test Barclay (Total)	(134)	(73.1)	(45.6)
King	70	76.8	47.5
100	43	68.0	42.9
King Menthol	15	73.0	46.3
100 Menthol	6	73.6	50.5
Carlton (Total)	(134)	(69.1)	(69.5)
King	70	72.8	72.6
100	43	58.5	60.0
King Menthol	15	75.3	75.5
100 Menthol	6	73.0	68.8
Merit (Total)	(134)	(32.4)	(33.2)
King	70	32.9	33.6
100	43	30.8	31.4
King Menthol	15	33.2	33.9
100 Menthol	6	36.7	39.2
Extended Filter (Total)	(134)	(72.2)	(32.2)
King	70	71.7	32.0
100	43	73.3	31.5
King Menthol	15	72.7	34.6
100 Menthol	6	81.8	42.6

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TABLE II (CONT'D.)

% DILUTION BY BRAND TYPE

BARCLAY PANEL

UNLIT

	Base Number of Respondents	Average % Dilution Tipped	Average % Dilution Untipped
Own Brand Barclay	(47)	(73.4)	(43.1)
King	35	75.3	42.2
100	6	63.0	38.4
King Menthol	5	73.1	54.5
100 Menthol	1	69.0	44.7
Test Barclay (Total)	(47)	(76.8)	(49.9)
King	35	80.3	50.3
100	6	63.2	42.6
King Menthol	5	71.2	56.2
100 Menthol	1	65.7	47.0
Carlton (Total)	(47)	(71.1)	(70.2)
King	35	72.9	72.4
100	6	58.1	56.6
King Menthol	5	77.7	76.4
100 Menthol	1	55.3	47.7
Merit (Total)	(47)	(31.4)	(31.3)
King	35	31.2	31.1
100	6	29.7	29.8
King Menthol	5	34.5	34.5
100 Menthol	1	33.7	30.3
Extended Filter (Total)	(47)	(71.9)	(33.4)
King	35	72.2	32.6
100	6	71.0	35.9
King Menthol	5	72.5	38.8
100 Menthol	1	67.3	21.0

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TABLE II (CONT'D.)

% DILUTION BY BRAND TYPE

BARCLAY PANEL

LIT

	Base Number of Respondents	Average % Dilution Tipped	Average % Dilution Untipped
Own Brand Barclay	(47)	(79.8)	(54.6)
King	35	81.3	53.8
100	6	71.7	52.7
King Menthol	5	81.3	67.3
100 Menthol	1	69.5	30.0
Test Barclay (Total)	(47)	(82.8)	(60.2)
King	35	86.0	63.3
100	6	70.5	50.5
King Menthol	5	76.9	54.9
100 Menthol	1	76.0	36.0
Carlton (Total)	(47)	(80.7)	(79.4)
King	35	83.0	81.4
100	6	66.2	65.7
King Menthol	5	85.9	85.4
100 Menthol	1	62.0	59.5
Merit (Total)	(47)	(41.7)	(41.0)
King	35	41.6	40.9
100	6	41.5	40.9
King Menthol	5	42.6	44.8
100 Menthol	1	39.5	26.5
Extended Filter (Total)	(47)	(80.5)	(45.4)
King	35	80.9	43.9
100	6	79.2	51.9
King Menthol	5	79.4	50.8
100 Menthol	1	81.5	34.0

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III. SUMMARY OF RESEARCH DESIGN

III. SUMMARY OF RESEARCH DESIGN

A. RESPONDENT PANEL

Five-hundred (500) respondents were pre-recruited for study participation via telephone, group and direct intercept recruiting. Respondents qualified for study participation if they:

- Had no critical industry affiliation,
- Had not participated in any market research survey three months prior to the test date,
- Had not participated in any market research survey concerning cigarettes in the past year, and
- Smoked at least ten (10) filtered cigarettes daily.

Utilizing the brand share, age and sex quotas derived from the 1981 Roper Reports the following quotas were established.

- 51.2% of the panel male
  - 44.7% 18-34 years of age
  - 55.3% 35 and older

- 48.8% of the panel female
  - 43.7% 18-34 years of age
  - 56.3% 35 and older

All of the respondents participated in an unlit test and one-hundred thirty-four (134) of the five-hundred (500) participated in a lit test.

Due to a twenty percent (20%) over recruitment required to accommodate no shows, etc., the following represents the final quotas achieved.

	UNLIT	LIT
• Male	47.0	47.7
18-34 years of age	67.0	52.0
35 and older	33.0	48.0
• Female	53.0	52.2
18-34 years of age	48.0	33.0
35 and older	52.0	67.0

Respondents were further screened for regular brand of cigarette smoked to include the following brand share representation. The final test brand quotas vary slightly from the target quota.

BRAND	TARGET PERCENT	UNLIT TEST FINAL PERCENT	LIT TEST FINAL PERCENT
Barclay	1.4	1.6	3.7
Belair	1.2	0.8	NONE
Benson & Hedges	4.6	4.8	4.5
Camel Lights	2.6	0.4	NONE
Carlton	2.4	1.4	2.2
Doral	0.4	NONE	NONE
Golden Lights	1.6	0.6	NONE
Kent	3.0	4.0	6.7

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BRAND	TARGET PERCENT	UNLIT TEST FINAL PERCENT	LIT TEST FINAL PERCENT
Kool	8.2	6.0	8.8
L & M	0.8	3.0	2.6
Lark	0.4	0.7	0.2
Marlboro	18.4	24.6	26.8
More	1.6	1.5	0.6
Merit	4.6	3.7	3.6
Newport	2.4	1.5	4.6
Now	0.8	1.0	0.2
Old Gold	0.4	NONE	NONE
Pall Mall	1.2	3.0	2.8
Parliament	1.2	10.4	7.2
Raleigh	1.6	0.7	0.8
Salem	8.8	4.5	8.4
Saratoga	0.4	NONE	0.2
Tareyton	1.6	0.7	0.8
Triumph	0.4	NONE	NONE
True	1.6	6.0	4.6
Vantage	3.8	4.5	2.2
Viceroy	1.6	1.0	o.8
Virginia Slims	2.6	2.2	3.0
Winston	12.2	7.5	7.4
All Other Brands	7.2	1.0	0.8

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It was further ascertained during screening whether the respondent's own brand was a:

- Regular (King)
- 100's
- Regular (King) Menthol
- 100's Menthol
- Slim/120's or longer
- Slim/120's or longer Menthol

Once respondents had been successfully screened and were willing to participate they were brought into the test facility. They were requested to bring their own cigarettes with them. One reason was to verify their regular brand, the other reason was as part of their test they would puff their own brand.

Each respondent tested:

- Their Own Brand
- A Barclay
- A Carlton
- A Merit, and
- An Extended Filter

Furthermore, with the exclusion of the Extended Filter, each respondent received a Barclay, a Carlton and a Merit compatible to their own brand: either regular flavor King or 100's or mentholated King or 100's. Those few respondents who normally smoked a slim, 120 or longer received 100's of the aforementioned brands.

Testing for all respondents was initially conducted with unlit cigarettes. Respondents adhered to the following progression of testing:

- First they puffed on their own brand of cigarette three times to familiarize themselves with the basic test procedure. That cigarette was discarded.
- A second own brand cigarette was then attached to the Puff Parameter Analyzer with a tip applied to the cigarette. The respondent puffed three times to confirm the test unit's proper functioning.
- Using the same tipped own brand cigarette the respondent then puffed three more times. The percent dilution for each puff was recorded.
- The tip was removed and the percent dilution of three more puffs was recorded.

- The respondent always puffed their own brand first, tipped then untipped. They then puffed a Barclay, a Carlton, a Merit and an Extended Filter three times tipped, followed by three times untipped. The percent dilution was recorded after each individual puff. The presentation of these brands was rotated among the respondent panel.

- Those respondents who participated in the lit test adhered to the aforementioned procedures, with the exception of taking two (2) puffs, rather than three (3) for each brand. Additionally, all puffs recorded after verifying unit functioning, was with lit cigarettes.

The aforementioned procedures employed for the unlit test and lit test were followed for the separate panel of regular Barclay smokers.

While the individual cigarettes were not brand blinded, the cigarettes were presented in a covered tray and during the puff test the respondent could not see the brand identification. The brands of cigarettes tested and the purpose of the study was not disclosed at any time to any respondent, during screening, during the test conduct or after.

Three (3) Puff Parameter Analyzers were used throughout the study. The use of each machine was rotated across the respondent panel. The respondents were so positioned that during the test they could not see the front of the test units.

Testing occurred at the United States Testing Company's Hoboken facility, Monday, January 25 through Saturday, February 6, 1982.

All test product, excluding the Extended Filter, was purchased at the wholesale level from two different wholesalers, by a representative the Testing Company from the Northeastern section of New Jersey, specifically Hoboken and North Bergen. All product purchased was in soft packs only.

A copy of the test materials is included in the Appendix of this report.

The following details the test procedures utilized.

IV. DETAILED RESEARCH DESIGN

TEST PROCEDURAL FLOW

TEST PROCEDURES

UNLIT TEST

GENERAL INFORMATION

1. Test Familiarization Puff: Each respondent should be asked to puff three times on one of their own cigarettes with no tip and not attached to apparatus. This is so they can familiarize themselves with puffing on an unlit cigarette.
2. Verification: Each time a new respondent enters, you must perform a dilution test to verify the machine is operating properly. For this part of the test, the respondent's own cigarette is always the cigarette used. The cigarette is always tipped. The respondent will be required to puff on this cigarette three times to fulfill test requirements.

ALWAYS RESET MACHINE AFTER DILUTION TEST

3. Actual Test: In the actual puff test, each cigarette will be puffed three times with a tip and three times without a tip.
4. The respondent's own cigarette is always the first cigarette tested. The code number for respondent's own cigarette is always #81.
5. Each cigarette is always tested FIRST WITH TIP and SECOND WITHOUT TIP.
6. Although you offer water at the beginning of the test, ask the respondent once or twice during the test if they would like a sip.
7. If you notice Puff Volume decreasing from puff to puff, the respondent may be becoming fatigued. If this occurs ask if they would like to rest a moment. (DO NOT INDICATE WHY YOU ARE ASKING.) Abide by their response.

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8. If a puff is invalid, DO NOT tell respondent something is wrong, puff was invalid, or any other phrase which might intimidate them. Simply X out data on print-out and ask respondent to puff again.

BE SURE YOU ALWAYS HAVE 3 VALID PUFFS WITH TIP AND 3 VALID PUFFS WITHOUT TIP.

UNITED STATES TESTING COMPANY, INC.

TEST PROCEDURE

UNLIT TEST

RESPONDENT ENTERS.

Hello, Mr./Ms._____. Today we are conducting a test about smoking. I would like to let you know that during this test if you wish to stop for a moment to rest, it is fine. Also should your mouth become dry, we have a cup of water here for you to drink. Please feel free to take a sip whenever you wish.

I will be asking you to puff on five different cigarettes. None of them will be lit. One of them will be your own brand. I will need two of your cigarettes from your pack. HAND RESPONDENT ONE OF THEIR OWN UNLIT CIGARETTES. So you can familiarize yourself with the procedure, I would like you to puff three times on this cigarette of yours as if it were lit. THEN PLACE THE OTHER ONE OF RESPONDENT'S CIGARETTES IN #1 SLOT IN CIGARETTE TRAY. BEGIN TEST.

DILUTION TEST

WHILE RESPONDENT IS DOING THIS YOU MUST DO THE FOLLOWING:

1. INSERT THEIR OWN BRAND CIGARETTE (CIG. #1 IN TRAY) - ROD FIRST - INTO HOLDER.

MAKE SURE DENTAL DAMS HAVE SEALED, INSURING NO AIR WILL ENTER HOLDER.

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II. PLACE CIGARETTE IN HOLDER SO THAT DILUTION HOLES ARE INSIDE HOLDER.

DILUTION HOLES MUST BE TOTALLY INSIDE GLASSWARE.

HOLDING ROD STEADY SO CIGARETTE DOESN'T MOVE, PLACE TIP ON EXPOSED FILTER PART OF CIGARETTE. MOVE TO MARKED LINE (EVEN WITH DENTAL DAM ON HOLDER).

CHECK TO MAKE SURE DENTAL DAM IS PROPERLY SEALED SO THAT NO AIR WILL ENTER THE TIP.

III. PLACE COMPLETED HOLDER INTO STRAIGHT CHAMBER AND TIGHTEN SCREW CAP SO THAT HOLDER CANNOT BE PULLED FROM CHAMBER.

IV. CHECK TO MAKE SURE THAT BLACK CODED TUBING FOR DILUTION TEST IS CORRECTLY ATTACHED - ONE END ON ROD PORT IN BACK, THE OTHER ON THE DILUTION PORT IN FRONT. TUBING FOR ACTUAL PUFF TEST IS ATTACHED AS FOLLOWS:

TUBE COLOR CODED RED (LEADING TO STRAIGHT CHAMBER) IS ATTACHED TO ROD PORT - COLOR CODED RED-ON FRONT OF MACHINE. TUBE COLOR CODED BLUE (ATTACHED TO HOLDER) IS NOT ATTACHED TO MACHINE. BLUE CODED END IS PLUGGED CLOSED DURING DILUTION TEST. THIS TUBE IS NOT ATTACHED TO MACHINE DURING DILUTION TEST.

FEED PRINTER PAPER AND WRITE RESPONDENT NUMBER AND "TRIAL" ON END OF TAPE. AFTER DOING AND CHECKING ABOVE, TAKE RESPONDENT'S PRACTICE CIGARETTE AND THROW IT AWAY. HAND RESPONDENT ASSEMBLED APPARATUS.

Now, I would like you to puff on this cigarette as if it were lit. You may adjust the tip to fit comfortably into your mouth. I will let you know when it is OK to puff and you may respond at your leisure.

FLIP RUN/LOCK SWITCH FROM LOCK TO RUN.

Whenever you're ready, please puff.

WHEN RESPONDENT HAS COMPLETED PUFF AND STATUS READS WAIT RETURN RUN/LOCK SWITCH TO LOCK.

CHECK NUMBERS 4, 5, 6 ON MACHINE. MAKE SURE PERCENT DILUTION READS 50 +/- 2, i.e., 48 or 52. (IF IT DOESN'T CALL TEST SUPERVISOR TO CHECK.) WHEN YOU ARE SURE THAT YOU HAVE A VALID PUFF FLIP RUN/LOCK SWITCH BACK TO RUN. MAKE SURE STATUS READS READY. (THIS 50 +/- 2 REFERS TO VERIFYING PUFFS ONLY.)

REPEAT FOR VERIFY PUFF #2.

REPEAT FOR VERIFY PUFF #3.

WHEN YOU ARE SURE YOU HAVE A VALID THIRD PUFF, TAKE THE FOLLOWING STEPS FOR:

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ACTUAL PUFF TEST

I. TAKE APPARATUS FROM RESPONDENT.

II. REMOVE BLACK CODED TUBING FROM DILUTION PORT.

III. UNPLUS BLUE CODED TUBING AND ATTACH TO DILUTION PORT ALSO CODED BLUE.

IV. PUSH RESET BUTTON ON BACK OF MACHINE. AT THIS POINT PRINTER WILL ONCE AGAIN PRINT OUT FORMAT.

V. WHEN PRINTER HAS STOPPED, DRAW A LINE ACROSS THE PAPER. IN LEFT MARGIN ABOVE LINE WRITE CODE NUMBER OF CIGARETTE AND A "T" TO INDICATE THE PUFF IS BEING TAKEN WITH A TIP.

VI. HAND APPARATUS BACK TO RESPONDENT.

VII. FLIP RUN/LOCK SWITCH TO RUN.

I'm going to ask you to take three puffs one at a time, on this cigarette as if it were lit. Whenever you are ready.

AFTER RESPONDENT HAS COMPLETED PUFF AND STATUS READS WAIT, RETURN RUN/LOCK SWITCH TO LOCK. CHECK READINGS ON #4, 5 AND 6. WHEN YOU ARE SURE YOU HAVE A VALID READING, FLIP RUN/LOCK SWITCH TO RUN.

REPEAT FOR TEST PUFF #2 - TIPPED.

REPEAT FOR TEST PUFF #3 - TIPPED.

AFTER YOU ARE SURE YOU HAVE THREE VALID PUFFS WITH TIP, ASK RESPONDENT FOR APPARATUS. AT THIS TIME, REMOVE THE TIP FROM THE CIGARETTE. RECONFIRM CIGARETTE IS STILL IN PLACE WITH MARK FLUSH WITH DENTAL DAM ON HOLDER.

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FEED PAPER TO INDICATE END OF TIPPED PART OF TEST. WRITE "UT" IN LEFT HAND MARGIN TO INDICATE UNTIPPED PART OF TEST. HAND APPARATUS TO RESPONDENT.

FOR THIS PORTION OF TEST IN WHICH CIGARETTE IS UNTIPPED, REPEAT ALL STEPS FOR TIPPED PORTION OF TEST.

AFTER YOU ARE SURE YOU HAVE THREE VALID PUFFS WITHOUT TIP ASK RESPONDENT TO RETURN APPARATUS TO YOU.

I. REMOVE HOLDER FROM STRAIGHT CHAMBER.

II. REMOVE CIGARETTE FROM HOLDER BY PULLING ROD.

III. PLACE CIGARETTE IN VIAL MARKED WITH RESPONDENT NUMBER.

IV. FEED PRINTER PAPER AND DRAW LINE ACROSS IT TO INDICATE END OF TEST FOR THAT CIGARETTE.

ABOVE LINE IN LEFT MARGIN WRITE CODE NUMBER FOR CIGARETTE #2 AND A "T" TO INDICATE TIPPED.

V. TAKE CIGARETTE #2 FROM CIGARETTE TRAY - TOUCHING ROD ONLY - AND FOLLOW HOLDER INSERTION AND TIPPING PROCEDURE FOR CIGARETTE #1. FOLLOW OPERATIONS PROCEDURES LISTED ABOVE FOR CIGARETTES #2 THROUGH #5. AFTER LAST PUFF ON CIGARETTE #5 SAY:

Thank you very much for your time and cooperation.

FEED PRINTER PAPER, CUT OFF AND PUT INTO RESPONDENT'S FOLDER.

CAP VIAL WITH ALL FIVE CIGARETTES TESTED IN IT AND PUT ONTO TRAY.

REMOVE HOLDER AND PLACE ON TRAY SO THAT TRAY PREP PERSON MAY CHANGE DENTAL DAMS. RETURN TRAY TO TRAY PREPARATION PERSON, OBTAIN TRAY FOR NEXT RESPONDENT AND FOLLOW ABOVE PROCEDURES.

UNITED STATES TESTING COMPANY, INC.

TEST PROCEDURES

LIT TEST

GENERAL INFORMATION

BECAUSE TIMING IS CRUCIAL IN THIS TEST THREE PEOPLE WILL BE AT THE MACHINE FUNCTIONING AS FOLLOWS:

MACHINE OPERATOR: Reading data, operating RUN/LOCK SWITCH, writing, helping handle glassware.

ASSISTANT: Doing the bulk of work with glassware, cigarettes, code numbers, etc.

PUMP OPERATOR: Operates pump to clear out smoke chamber between puffs.

1. Test Familiarization Puff: Each respondent should be asked to puff two times on one of their own cigarettes with no tip and not attached to apparatus. This is so they can familiarize themselves with puffing on an unlit cigarette for verification test.
2. Verification: Each time respondent enters, you must perform a dilution test to verify the machine is operating properly. The cigarette is UNLIT for this part of test. For this part of the test, the respondent's own cigarette is always the cigarette used. The cigarette is always tipped. The respondent will be required to puff on this cigarette two times to fulfill test requirements.

ALWAYS RESET MACHINE AFTER DILUTION TEST

3. Actual Test: After the cigarette is lit, each cigarette will be puffed two times with a tip and two times without a tip.
4. The respondent's own cigarette is always the first cigarette tested. The code number for respondent's own cigarette is always #81.
5. The cigarette is always tested FIRST WITH TIP and SECOND WITHOUT TIP. Timing is of the essence. If a total of four puffs are not obtained before cigarette reaches dental dam, entire procedure (except trial) must be repeated with a new cigarette. All four puffs MUST come from one cigarette.
6. Although you offer water at the beginning of the test, ask the respondent once or twice during the test if they would like a sip.
7. If you notice Puff Volume decreasing from puff to puff, the respondent may be becoming fatigued. If this occurs ask if they would like to rest a moment. (DO NOT INDICATE WHY YOU ARE ASKING.) Abide by their response. Ask only between cigarettes.
8. If a puff is invalid, DO NOT tell respondent something is wrong, that the puff was invalid, or any other phrase which might intimidate them. Simply X out information on printed paper.

ALWAYS MAKE SURE YOU HAVE
2 VALID PUFFS WITH TIP AND
2 VALID PUFFS WITHOUT TIP.

TEST PROCEDURES

LIT TEST

Hello, Mr./Ms._____. Today we are conducting a test about smoking. I would like to let you know that during this test if you wish to stop for a moment to rest, it is fine. Also, should your mouth become dry, we have a cup of water here for you to drink. Please feel free to take a sip whenever you wish.

There are two parts to this test. First, I will be asking you to puff on five different cigarettes. None of them will be lit. One of them will be your own brand. Next, I will ask you to puff on five different cigarettes lit. One of them will be your own brand. I will need three of your own cigarettes.

(PLACE ONE OF RESPONDENT'S CIGARETTES IN NUMBER ONE SLOT IN CIGARETTE TRAY.)

(AT THIS POINT - PERFORM ALL STEPS FOR UNLIT TEST INCLUDING "TRIAL.)

AFTER UNLIT TEST IS COMPLETE, PUT PRINT OUT IN RESPONDENT FILE AND PUT FILE AND TRAY ASIDE, PERFORM FOLLOWING STEPS FOR LIT TEST.

DILUTION TEST

I. ATTACH BLACK CODED TUBING TO MACHINE.

II. INSERT THEIR OWN BRAND CIGARETTE - ROD FIRST - INTO HOLDER.

MAKE SURE DENTAL DAMS HAVE SEALED, INSURING NO AIR WILL ENTER HOLDER.

III. PLACE CIGARETTE IN HOLDER SO THAT DILUTION HOLES ARE INSIDE HOLDER.

DILUTION HOLES MUST BE TOTALLY INSIDE GLASSWARE.

HOLDING ROD STEADY SO CIGARETTE DOESN'T MOVE, PLACE TIP ON EXPOSED FILTER PART OF CIGARETTE. MOVE IT SO IT IS FLUSH WITH DENTAL DAM ON HOLDER.

CHECK TO MAKE SURE DENTAL DAM IS PROPERLY SEALED SO THAT NO AIR WILL ENTER THE TIP.

IV. PLACE COMPLETED HOLDER INTO SMOKING CHAMBER AND TIGHTEN SCREW CAP SO THAT HOLDER CANNOT BE PULLED FROM CHAMBER.

V. CHECK TO MAKE SURE THAT BLACK CODED TUBING FOR DILUTION TEST IS CORRECTLY ATTACHED - ONE END ON ROD PORT IN BACK, THE OTHER ON THE DILUTION PORT IN FRONT. TUBING FOR ACTUAL PUFF TEST IS AS FOLLOWS:

TUBE COLOR CODED RED (LEADING TO SMOKING CHAMBER) IS ATTACHED TO ROD PORT - COLOR CODED RED ON FRONT OF MACHINE. TUBE COLOR CODED DARK BLUE (ATTACHED TO HOLDER) IS NOT ATTACHED TO MACHINE. DARK BLUE CODED END IS PLUGGED CLOSED DURING DILUTION TEST. THIS TUBE IS NOT ATTACHED TO MACHINE DURING DILUTION TEST.

FEED PRINTER PAPER AND WRITE RESPONDENT NUMBER ON END OF TAPE. AFTER DOING AND CHECKING ABOVE, TAKE RESPONDENT'S CIGARETTE AND THROW IT AWAY. HAND RESPONDENT ASSEMBLED APPARATUS.

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Now, I would like you to puff on this cigarette as if it were lit. You may adjust the tip to fit comfortably into your mouth. I will let you know when it is OK to puff and you may respond at your leisure.

FLIP RUN/LOCK SWITCH FROM LOCK SWITCH FROM LOCK TO RUN.

Whenever you're ready, please puff.

WHEN RESPONDENT HAS COMPLETED PUFF AND STATUS READS WAIT RETURN RUN/LOCK SWITCH TO LOCK.

CHECK NUMBERS 4, 5, 6 IN LEFT MARGIN OF TAPE COMING FROM PRINTER. WRITE "TRIAL".

MAKE SURE PERCENT DILUTION READS 50 +/-2, i.e., 48 or 52. (IF IT DOESN'T, CALL TEST SUPERVISOR TO CHECK.) WHEN YOU ARE SURE THAT YOU HAVE A VALID PUFF FLIP RUN/LOCK SWITCH BACK TO RUN. MAKE SURE STATUS READS READY. (THIS 50+/-2 REFERS TO VERIFYING PUFFS ONLY.)

REPEAT FOR VERIFY PUFF #2.

WHEN YOU ARE SURE YOU HAVE A VALID SECOND PUFF, TAKE THE FOLLOWING STEPS FOR:

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UNITED STATES TESTING COMPANY, INC.

ACTUAL PUFF TEST

I. TAKE APPARATUS FROM RESPONDENT.

II. REMOVE BLACK CODED TUBING FROM DILUTION PORT.

III. UNPLUG BLUE CODED TUBING AND ATTACH TO DILUTION PORT ALSO CODED BLUE.

IV. PUSH RESET BUTTON ON BACK OF MACHINE. AT THIS POINT PRINTER WILL ONCE AGAIN PRINT OUT FORMAT.

V. WHEN PRINTER HAS STOPPED, DRAW A LINE ACROSS THE PAPER. WRITE IN LEFT MARGIN ABOVE LINE CODE NUMBER OF CIGARETTE AND A "T" TO INDICATE THE PUFF IS BEING TAKEN WITH A TIP.

VI. REMOVE HOLDER FROM SMOKING CHAMBER. HAND RESPONDENT HOLDER. LIGHT CIGARETTE. MAKE SURE IT IS LIT. IF ONLY PARTLY LIT ASK RESPONDENT TO TAKE ANOTHER PUFF. REPLACE LIT CIGARETTE INTO SMOKING CHAMBER. HAND APPARATUS BACK TO RESPONDENT.

VII. FLIP RUN/LOCK SWITCH TO RUN.

I'm going to ask you to take two puffs one at a time, on this cigarette. Whenever you are ready.

AFTER RESPONDENT HAS COMPLETED PUFF AND STATUS READS WAIT, RETURN RUN/LOCK SWITCH TO LOCK. REMOVE HOLDER FROM SMOKING CHAMBER (ASSISTANT WILL HELP). HAND CHAMBER TO ASSISTANT. (PUMP OPERATOR WILL CLEAR SMOKE FROM CHAMBER).

DURING THIS YOU SHOULD READ DATA TO INSURE PUFF IS VALID. WHEN CHAMBER IS CLEARED OF SMOKE YOU AND ASSISTANT WILL SECURE HOLDER IN SMOKE CHAMBER. WHEN HOLDER IS RESECURED HAND APPARATUS BACK TO RESPONDENT.

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FLIP RUN/LOCK SWITCH TO RUN.

REPEAT FOR TEST PUFF #2 - TIPPED.

AFTER YOU ARE SURE YOU HAVE TWO VALID PUFFS WITH TIP, REMOVE TIP FROM CIGARETTE. RECONFIRM CIGARETTE IS STILL IN PLACE WITH MARK FLUSH WITH DENTAL DAM ON HOLDER. FEED PAPER AND WRITE "UT" IN LEFT MARGIN. FOR THIS PORTION OF TEST IN WHICH CIGARETTE IS UNTIPPED, REPEAT ALL STEPS LISTED FOR TIPPED PART OF TEST.

REPEAT FOR TEST PUFF #2 - UNTIPPED

AFTER YOU HAVE CHECKED DATA AND ARE CERTAIN YOU HAVE A VALID SECOND PUFF WITHOUT THE TIP, INDICATE SAME TO ASSISTANT. ASSISTANT WILL THEN CUT OFF LIT END OF CIGARETTE INTO BOWL OF WATER. WITH TWEEZERS ASSISTANT WILL REMOVE CIGARETTE - ROD FIRST - FROM HOLDER AND DEPOSIT IT INTO VIAL MARKED WITH RESPONDENT'S NUMBER.

WHILE ASSISTANT IS INSERTING CIGARETTE #2 INTO HOLDER AND PLACING TIP ON IT (NEW PLASTIC TIP WITH EACH CIGARETTE), YOU WILL FEED PRINTER PAPER, DRAW A LINE ACROSS IT, WRITE IN CODE NUMBER OF NEW CIGARETTE AND A "T" TO INDICATE TIPPED TEST.

FOLLOW OPERATIONS PROCEDURES LISTED ABOVE FOR CIGARETTES #2 THROUGH 5. AFTER LAST PUFF ON CIGARETTE #5:

Thank you very much for your time and cooperation.

FLED PRINTER PAPER, CUT OFF AND PUT INTO RESPONDENT'S FILE. CAP VIAL CONTAINING ALL FIVE CIGARETTES TESTED AND PUT ONTO TRAY.

REMOVE TUBES FROM MACHINE AND PLACE ON TRAY SO THAT GLASS WASHER MAY CLEAN. (AN ENTIRE NEW APPARATUS WILL BE ON NEXT TRAY.)

RETURN TRAY TO TRAY PREPARATION PERSON, OBTAIN TRAY FOR NEXT RESPONDENT AND FOLLOW ABOVE PROCEDURES.

YOU ARE PROVIDED WITH EXTRA GLASS HOLDERS AND TIPS FOR THIS TEST. IF AT ANY TIME THE DENTAL DAMS ARE SINGED OR BECOME DIRTY CHANGE HOLDER OR GLASS TIP. (DENTAL DAMS WILL ALREADY BE ON THEM).

YOU ARE PROVIDED WITH FIVE EXTRA PLASTIC TIPS. BE SURE TO CHANGE PLASTIC TIPS AFTER EACH CIGARETTE SO THAT TASTE WILL NOT OVERWHELM RESPONDENTS.

GLOSSARY OF TERMS

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For the purpose of this test you will need to know the following terminology:

DENTAL DAM - White round rubberized piece with hole in middle

DILUTION HOLES - Holes in wrapping paper around filter

GLASS TIP - Funnel shaped glass piece

HOLDER - Larger glass piece through which cigarette is placed

O - RING - Black rubberized rings

O - RING APPLICATOR - White plastic piece kept in O - ring box to aid in application of dental dams and O - rings to glassware

PLASTIC TIP - White "cigar" tip

ROD - The tobacco part of the cigarette

SMOKING CHAMBER - Large glass jar-like piece with black screw cap to be used for every lit test

STRAIGHT CHAMBER - Long glass tube with black screw cap used for unlit only tests

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TEST SUPERVISOR

CALIBRATION INSTRUCTIONS

TEST SUPERVISOR

CALIBRATION INSTRUCTIONS

PRELIMINARY STEPS

1. Turn Power ON/OFF switch to ON. Make sure red ON Light is lit and that format prints out.

   IF ABOVE DOES NOT OCCUR, CHECK ALL ELECTRICAL CONNECTIONS.

2. Allow machines to warm up for at least 30 minutes.

   A PERIOD OF ONE HOUR IS THE PREFERRED WARM UP TIME.

3. Turn on flow calibrator and vacuum pump five to ten minutes prior to beginning calibration.

4. Attach tubing to VACUUM FLOW IN port on front of flow calibrator.

5. Attach vacuum pump tube into VACUUM PUMP port in back of flow calibrator.

6. Check to make sure SOURCE/METER knob is turned to SOURCE.

   NOTE: WHEN VACUUM PUMP IS TURNED ON METER ON BACK OF FLOW CALIBRATOR SHOULD REGISTER 15, +/-1 or 2. IF METER DOES NOT REGISTER CORRECTLY, DO NOT TRY TO READJUST. CALL TECHNICAL SUPERVISOR IMMEDIATELY.

CALIBRATION

1. After machines have warmed up for the prescribed period of time, turn the RUN/CALIBRATE switch to CALIBRATE.

2. At this time, the display should be reading close to zero on both ROD and DIL. If the readings differ greatly from zero, i.e., greater than 0005, the ZERO adjust pot. should be adjusted with jeweler's screwdriver to bring reading closer to zero.

   Note that the accuracy of the instrument is not affected by any difference the display might show from zero. It does not require a reading of exactly zero to be accurate. Further, if the display is reading exactly zero and never moves from this value, the ZERO adjust pot. for each flow must be adjusted to give a reading in the range of 0001-0005. The reason for this is that the unit does not display negative values and as such the calibration might have it far into the negative range of signals. This will greatly affect the instrument's accuracy and should be avoided.

3. After ZERO for both ROD and DIL have been adjusted so that the display reads between 0001 and 0005 for each, the SPAN must be adjusted. Set the FLOW: CC/MIN display on front of flow calibrator to read 1050.

4. Attach tubing on front of flow calibrator to ROD port on front panel of instrument. NOTHING SHOULD RUN TO THE DIL PORT.

   If the display does not read 1050, adjust SPAN adjust pot. until display does read 1050. Remove tubing from ROD port.

   RE-CHECK ZERO TO INSURE DISPLAY STILL READS 0001-0005 SINCE IT IS AFFECTED BY THE SPAN ADJUSTMENT.

5. If ZERO reading for ROD has risen above 0005, it will have to be readjusted and then the SPAN will have to be readjusted. Repeat process until ZERO reads between 0001 and 0005 and SPAN reads 1050.

6. After both ZERO and SPAN are correctly adjusted for ROD, DIL span must be adjusted.

7. Attach tubing on front of flow calibrator to DIL port on front panel of instrument. NOTHING SHOULD RUN TO ROD PORT

8. If the display does not read 1050, adjust SPAN adjust pot. until display does read 1050. Remove tubing from DIL port.

   RE-CHECK ZERO TO INSURE DISPLAY STILL READS 0001-0005 SINCE IT IS AFFECTED BY THE SPAN ADJUSTMENT.

8. If ZERO reading for DIL has risen above 0005, it will have to be readjusted and then the SPAN will have to be readjusted. Repeat process until ZERO reads between 0001 and 0005 and SPAN reads 1050.

AFTER INSTRUMENT IS CALIBRATED, PUSH THE RESET BUTTON ON THE BACK OF THE MACHINE.

9. Turn RUN/CALIBRATE switch to RUN and make sure RUN/LOCK switch is in LOCK. Display should read HOLD and machine is ready at this point for machine operators.